Ethnic density effects on psychological distress among Latino ethnic groups: an examination of hypothesized pathways

Article (Published Version)

Health & Place 30 (2014) 177–186

Contents lists available at ScienceDirect

Health & Place

journal homepage: www.elsevier.com/locate/healthplace

Ethnic density effects on psychological distress among Latino ethnic groups: An examination of hypothesized pathways

Laia Bécares *

Centre on Dynamics of Ethnicity, University of Manchester, Oxford Road, Manchester M13 9PL, UK

ARTICLE INFO

Article history:
Received 21 February 2014
Received in revised form
10 September 2014
Accepted 16 September 2014
Available online 8 October 2014

Keywords:
Ethnic density
Latinos
Social cohesion
Racism
Psychological distress

ABSTRACT

Studies among US Latinos provide the most consistent evidence of ethnic density effects. However, most studies conducted to date have focused on Mexican Americans, and it is not clear whether ethnic density effects differ across Latino sub-groups, generational status, or measures of ethnic density. In addition, the mechanisms behind ethnic density are not well understood. This study uses a multi-group structural equation modeling approach to analyze the Latino sample from the National Latino and Asian-American Study ($n=1940$) and examine ethnic density effects on psychological distress among Latino sub-groups, and explore two hypothesized mechanisms: increased neighborhood cohesion and reduced exposure to interpersonal racism. Results of the main effects between ethnic density and health, and of the hypothesized mechanisms, show clear differences across Latino ethnic groups, generational categories and measures of ethnic density. Findings highlight that ethnic density effects and their mechanisms depend on the current and historical context of Latino sub-groups, including reasons for migration and rights upon arrival.

1. Introduction

It is now well established that living in deprived neighborhoods is associated with increased mortality and morbidity, independent of individual-level attributes (Pickett and Pearl, 2001; Riva et al., 2007). Due to limited socioeconomic resources and other consequences of entrenched institutionalized racism, ethnic minorities are more likely to live in deprived neighborhoods, a factor which contributes to longstanding ethnic inequalities in health (Williams and Collins, 2001). Given the high correlation between area-level deprivation and the percentage of ethnic minorities living in a neighborhood, the concentration of ethnic minorities in an area is often used as a proxy for deprivation, and considered an indicator of deleterious neighborhood effects. However, studies that have examined the association between the concentration of ethnic minorities in a neighborhood (ethnic density) and health, while adequately adjusting for area deprivation, have reported that increased ethnic density is often associated with improved health among ethnic minority residents (Bécares et al., 2012b; Shaw et al., 2012), a phenomena termed the ethnic density effect.

Recent years have seen an increase in the number of studies examining ethnic density effects on health, but the literature is still characterized by inconclusive findings, whereby ethnic density effects are not consistent across ethnic groups, neither within nor between countries. Investigations of ethnic density effects among the Latino population in the US provide the most consistent evidence of protective ethnic density effects, with associations between increased Latino ethnic density and improved health reported across several indicators of physical and mental health (Bécares et al., 2012b; Shaw et al., 2012).

However, studies have mainly centered on the Mexican American group, so results are not generalizable to the overall US Latino population or to other Latino ethnic groups. Only two studies to date have examined ethnic density effects across different Latino sub-groups, reporting differential ethnic density effects across Latino ethnic groups. A study of Puerto Rican and Mexican Americans in Chicago found an association between segregation and increased depression and anxiety among Mexican Americans, but not among Puerto Ricans (Lee, 2009). The other study found a suggestion of a protective effect on preterm birth for Spanish Caribbean and Central American mothers living in New York City, but not for South American women (Mason et al., 2011). This difference in findings may reflect the heterogeneity within the broad US Latino categorization. Latinos are the largest ethnic minority in the US, representing 16.7% of the total population (Ennis et al., 2011). The Latino population is composed of a variety of different sub-groups, with the major groups being Mexican, Puerto Rican and Cuban Americans, respectively encompassing the 63%, 9.2% and 3.5% of all Latinos (Ennis et al., 2011).

* Tel.: +44 161 275 4721.
E-mail address: laia.becares@manchester.ac.uk

http://dx.doi.org/10.1016/j.healthplace.2014.09.010

The complexity of Latino ethnicity results from their diverse national origins and migration histories (Portes and Truelove, 1987), which has led to differences in sociodemographic characteristics and lived experiences of ethnicity and minority status among the various groups. This diversity is subsequently reflected in different health profiles, with Puerto Ricans reporting worse health than Cuban Americans and Mexican Americans across a wide range of outcomes (Alegria et al., 2007; Zsembik and Fennell, 2005). Large heterogeneity in health status also exists among US Latinos across immigrant categories; the health of Latino immigrants and subsequent generations deteriorate with length of stay in the United States, as Latinos acculturate and are exposed to discrimination, prejudice and other the pernicious effects of minority status (Vega and Amaro, 1994).

Differences in Latino sub-groups play out in relation to neighborhood-related outcomes and processes, including ethnic density effects (Lee, 2009; Mason et al., 2011), which are also expected to differ across immigration categories. Due to obstacles in obtaining social services and citizenship rights for immigrants, family and social networks play a critical role in adaptation to life in the US (Vega et al., 1991). Geographic concentration fosters resource exchange in meeting immigrant needs (Alba and Nee, 1997), and first generation immigrants might benefit greatly from the social, instrumental and financial capital existent in areas of greater ethnic density (Chiswick and Miller, 2005; Portes and Zhou, 1993). However, the opposite effect may be exerted on later generations, for whom residence in a neighborhood of higher immigrant and Latino ethnic density might indicate downward assimilation (Portes and Rumbaut, 2000) and be associated with detrimental health and socioeconomic outcomes.

In addition to whether ethnic density differs among Latino subgroups and immigrant status, the literature is uncertain in relation to what type of ethnic density is more relevant, own-group, overall Latino, or Latin American immigrant ethnic density. Although studies generally operationalize the measure of ethnic density as the percentage of Latinos or Hispanics in an area, residential concentration in many Latino communities in the US is caused largely by the inflow of immigrants into one same area (Alba and Nee, 1997). Immigrants tend to initially settle within their ethnic community to facilitate communication with ethnic members and benefit from location-specific human capital acquired by neighborhood residents (longer term migrants or natives of the same country of origin), including information obtained directly and indirectly through established networks (Chiswick and Miller, 2005). For a population mostly composed of relatively recent migrants, it is possible that Latin American immigrant ethnic density is more relevant than own sub-group ethnic density or overall Latino ethnic density, and that these measures of ethnic density perform differently in relation to health outcomes and/or mechanisms linking ethnic density to health. Only one study to date has examined two measures of Latino ethnic density (overall Latino and immigrant ethnic density, albeit only among US- and native-born Mexican people) which reported that whereas increased Latino residential concentration was protective for US-born mothers (but not among Mexico-born mothers), increased immigrant residential concentration exerted a detrimental effect (Osypuk et al., 2010). This finding indicates a complex interaction between individual-level nativity status and neighborhood immigrant composition. Although this study found null associations for foreign-born Mexican mothers across measures of ethnic density, other studies have reported that the health benefits of Mexican immigrants only occur when they live in neighborhoods with greater concentrations of other immigrants (Cagney et al., 2007), signaling the relevance of same-group (nativity in this case) concentration in ethnic density effects. Studies that have compared measures of own and overall ethnic density show that whereas the effect sizes are larger for own ethnic density, associations are most often statistically significant for overall ethnic density (i.e., Latino ethnic density), which is likely a result of increased statistical power (Bécares, 2009).

As described above, the literature to date shows that ethnic density effects on health are complex, varying across ethnic groups, nativity status and conceptualizations of ethnic density. A recent review highlighted that further research is necessary to better understand whether, how, for whom, and under what conditions areas with greater concentrations of immigrant are health protective, in addition to measuring and examining the specific pathways through which enclaves are hypothesized to impact health outcomes (Viruell-Fuentes et al., 2012). Despite the recent rise in ethnic density research, the mechanisms operating behind the ethnic density effect are still largely unknown. Possible explanations behind the ethnic density effect include a decreased exposure to racism and discrimination (Bécares et al., 2009; Halpern and Nazroo, 2000), and enhanced social cohesion, mutual social support and a stronger sense of community and belongingness, which in turn provide protection from the consequences of discrimination on health (Bécares et al., 2009; Bhugra and Becker, 2005; Daley, 1998; Halpern and Nazroo, 2000; Smaje, 1995; Stafford et al., 2010). Among studies examining the ethnic density effect, only a few have empirically explored hypothesized pathways (Bécares et al., 2009; Stafford et al., 2010), and these have examined individual pathways separately, failing to understand the independent contribution of different hypothesized mechanisms to the association between ethnic density and health. In the case of US Latinos, there is an additional need to understand whether ethnic density effects, and their mechanisms, vary across sub-groups, and across measures of ethnic density.

The present study aims to contribute to the literature by: (1) examining the association between ethnic density and mental health across Latino sub-groups and immigration status; (2) exploring the mechanisms behind ethnic density effects on mental health among Latinos; (3) establishing whether these

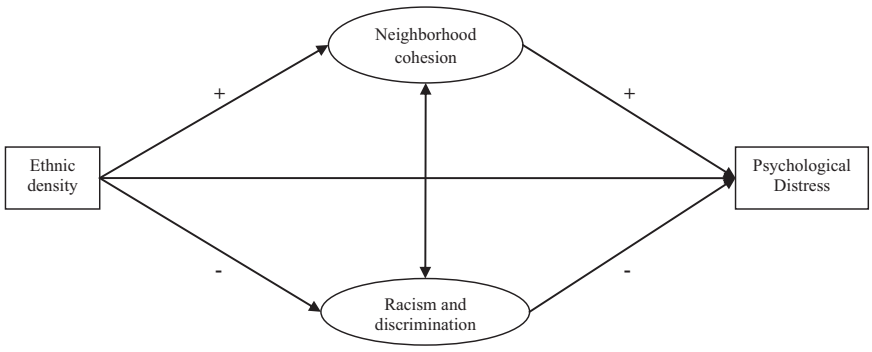


Fig. 1. Conceptual model.

mechanisms, and the association between ethnic density and mental health, differ depending on the measure of ethnic density used (own sub-group, overall Latino, or Latin American immigrant ethnic density), and (4) determining whether the observed relationships are the same across different Latino sub-groups.

This study simultaneously explores these three study aims using a structural equation modeling approach that empirically tests its theoretical framework, described in Fig. 1. Following the literature on ethnic density, the study proposes a conceptual model that incorporates the two main hypothesized mechanisms linking ethnic density to mental health: increased neighborhood social cohesion, and reduced exposure to interpersonal discrimination. As shown in Fig. 1, the conceptual model proposes that ethnic density is associated with the mental health of Latinos both directly and indirectly, through the hypothesized pathways.

The first mechanism by which ethnic density is hypothesized to protect the health of ethnic minorities, Latinos in this case, is through increased neighborhood social cohesion. Ethnic group membership is often a basis for networks of social relations (Bankston and Zhou, 2002), and a source of economic and moral support for second generations (Portes and Zhou, 1993). This pathway proposes that ethnic density generates higher neighborhood cohesion through a stronger sense of community and belongingness (Bhugra and Becker, 2005; Daley, 1998; Halpern and Nazroo, 2000; Smaje, 1995), thought to emerge from the networks and social relations existent in areas of greater ethnic density. Existent research has already documented the association between increased ethnic density and higher community social cohesion (Bécares et al., 2011), and between higher community social cohesion and lower morbidity (Berkman and Kawachi, 2000; Fone et al., 2007; Stafford et al., 2003). The present study extends this work by linking ethnic density, community social cohesion, and health, hypothesizing that ethnic density will impact on health through an increase in community social cohesion, which is in turn expected to be associated with better health.

The second pathway hypothesizes that ethnic density is associated with health through a decrease in the prevalence of experienced interpersonal racism. Experiences of racism have been widely documented to have a detrimental impact on health (Harris et al., 2006; Karlsen and Nazroo, 2002; Krieger and Sidney, 1996; Paradies, 2006), and this mechanism proposes that reduced exposure to interpersonal racism among Latinos living in areas of greater ethnic density will lead to a better health profile, as compared to Latinos living in areas with lower ethnic density.

2. Methods

2.1. Data

This study analyzed the Latino sample from the National Latino and Asian-American Study (NLAAS), a nationally-representative household survey of non-institutionalized adults (aged 18 years or older) living in one of the 50 US states or the District of Columbia. The final Latino NLAAS sample consisted of 2554 Latino Americans who self-identified as Mexican, Puerto Rican, Cuban or "other" in response to a question similar to that asked in the US census. The present analyses focus specifically on the Cuban ($n=577$), Puerto Rican ($n=495$), and Mexican American ($n=868$) sub-groups.

NLAAS data were collected by trained bilingual interviewers who conducted computer-assisted interviews in-person or by telephone between May 2002 and November 2003. The weighted response rate for Latinos was 75.5%, and the weighted sample is similar to the 2000 United States census population in age, sex, education, marital status and geographic distribution, but differs from the census population in its increased representation of immigrants and low-income participants (Alegria et al., 2004). More detail on the design and sampling procedures can be found elsewhere (Alegria et al., 2004; Heeringa et al., 2004).

2.2. Individual-level variables

Psychological distress was assessed with the Kessler-6 (Kessler et al., 2002), a measure of non-specific psychological distress captured by six questions, including: during the last thirty days, how often did you feel so depressed that nothing could cheer you up; did you feel restless or fidgety; did you feel that everything was an effort. Response categories ranged from (4) none of the time to (0) all of the time. Items were reverse-coded so that higher scores reflect greater levels of psychological distress. The Kessler-6 score was calculated as the sum of the reported scores. Internal consistency was high across the three samples (Cronbach's α for the Cuban sample: 0.89; Cronbach's α for the Puerto Rican sample: 0.87; Cronbach's α for the Mexican American sample: 0.85).

Discrimination was assessed with the 9-item Everyday Discrimination Scale (Williams et al., 1997), which asked participants to indicate how often they had experienced various forms of day-to-day discrimination over the previous 12 months due to their race, ancestry or national origin, including being treated with less respect than other people, receiving poorer service than other people at restaurants or stores, and people acting as if they are not smart. Responses ranged from 0 (never) to 5 (daily), with higher values reflecting more frequent experiences. Internal reliability for the Everyday Discrimination Scale was strong for all Latino sub-groups (Cronbach's α for Cuban respondents: 0.78; Cronbach's α for Puerto Rican respondents: 0.88; Cronbach's α for Mexican American respondents: 0.88).

Neighborhood cohesion was measured with a set of four questions which asked respondents to assess the truthfulness in a set of statements about their neighborhood, including 'people in this neighborhood can be trusted,' 'people generally get along with each other,' 'people in my neighborhood look out for each other,' and 'I have neighbors who would help me if I had an emergency.' Responses, which ranged from 1 "very true" to 4 "not at all true" were recoded so that higher values indicated greater neighborhood cohesion. The neighborhood cohesion scale was found to have strong internal consistency across Latino sub-groups (Cronbach's α for Cuban respondents: 0.81; Cronbach's α for Puerto Rican respondents: 0.80; Cronbach's α for Mexican American respondents: 0.80).

Individual socioeconomic status (SES) was measured using equivalized household income, employment status, and education. Household income was equivalized using a modified OECD Equivalence Scale (Hagenaars et al., 1994), which allows 1.0 for the first adult in the household, 0.5 for other adults and 0.3 for children under 17. Equivalized income was calculated by dividing household disposable income (income after taxes and transfers) by the equivalence score for the household, and was divided into five equally sized income quintiles. Employment status was categorized as 'employed', 'unemployed' or 'not in labor force'. Education was measured as the number of years of education completed, and was categorized into 11 years or less, 12 years, 13–15 years, and 16 years or more.

Individual-level covariates also included a three-category measure of immigrant status (US born; 1.5 generation: born abroad and migrated to the US before age 13; 1st generation: born abroad and migrated to the US at age 13 or after), age, sex, marital status (married or cohabiting; divorce, separated or widowed; never married), and language of interview (English or Spanish).

2.3. Area-level variables

The NLAAS was linked to the 2000 US Census in order to obtain data on ethnic residential concentration and area deprivation.

Census data were linked, via special license access, to NLAAS data by means of Federal Information Processing Standards codes at the county level, the lowest level of geographical disaggregation allowed by the special license access. Three measures of ethnic density were used to examine the ethnic density effect: own sub-group ethnic density, Latino ethnic density and Latin American immigrant ethnic density. Own ethnic density and Latino ethnic density were derived from the 2000 US Census question which asked, before the race question, whether persons were Spanish/Hispanic/Latino. Response categories were 'No, not Spanish/Hispanic/Latino,' 'Yes, Mexican, Mexican American, Chicano,' 'Yes, Puerto Rican,' 'Yes, Cuban,' and 'Yes, other Spanish/Hispanic/Latino.' Own ethnic density was defined as the percentage of people living in the respondent's county of their same Latino sub-group. For example, for the Cuban ethnic group, own ethnic density was calculated by dividing the number of people living in the county of a NLAAS respondent of Cuban origin who selected 'Yes, Cuban' on the census form by the total population in that census. This was conducted separately for respondents of Puerto Rican or Mexican origin.

Latino ethnic density was defined as the percentage of people who self-identified as Spanish/Hispanic/Latino (of any sub-group) in the respondent's county.

Latin American immigrant ethnic density was calculated using data from the 2000 US Census question which asked about country of birth, and was defined as the county percent of residents born in Latin America (including Caribbean, Central America, Mexico and South America).

All ethnic density variables were divided by 10 in order to estimate the association with psychological distress, racism and neighborhood cohesion for every 10 percentage point increase in ethnic density.

To assess area deprivation a factor was created with three indicators of area-level socioeconomic disadvantage, which included percent of persons with income below 125% of federal poverty level, percent of persons aged 25 years and over with less than high school diploma, and percent households receiving public assistance. Exploratory factor analysis was used to summarize area-level SES variables and indicated that the three measures were captured by a single factor (Cronbach's $\alpha = 0.84$), with higher scores representing higher deprivation.

To account for the broader composition of the county where NLAAS respondents live, a measure of percent non-Hispanic black residents was also included as a covariate.

2.4. Statistical analysis

Main effects of ethnic density on psychological distress were examined for each Latino sub-group and category of immigrant status in order to explore whether ethnic density effects on psychological distress differ between and within Latino sub-groups. Linear regression models used to examine main effects were conducted for each measure of ethnic density, category of immigrant status within Latino sub-groups, and each individual pooled Latino sub-group (combining all categories of immigrant status). Models were adjusted for age, sex, area-level deprivation, percent Black non-Hispanic in county, household income, education, work status, marital status, and language of interview. Pooled Latino sub-group models also adjusted for immigrant status.

To investigate the relationships between ethnic density, psychological distress, neighborhood cohesion and experienced discrimination across Latino ethnic groups, a multi-group structural equation model (SEM) was fitted to geocoded NLAAS data. Due to small sample sizes in some of the immigrant status categories, with some groups having a sample size smaller than 100, it was not possible to use the nuanced generational categories for the multi-group SEM analyses.

This analysis involved a two-step process. First, a measurement model was tested using confirmatory factor analysis to examine the relationships between the latent constructs and their observed indicator variables. Questionnaire items with correlated error terms were allowed to correlate within-factor on three occasions where theoretically justifiable. Models were assessed using several goodness-of-fit criteria. The chi-square is highly sensitive to sample size and distributional assumptions (Hu and Bentler, 1995), so this study used three other measures of model fit: the comparative fit index (CFI), the Tucker–Lewis index (TLI), and the root mean square error of approximation (RMSEA). The CFI and TLI range in value from 0 to 1, with a value of greater than 0.9 indicating a good fit. RMSEA values range from 0 (perfect fit), to 1 (not acceptable). Values up to 0.05 are considered a good fit (Browne and Cudeck, 1993). Measurement models with multi-group specifications determine group effects on the latent variables, indicating whether loadings differ across groups. If the factor loadings of observed indicator variables on their respective latent factors do not differ significantly across groups measurement invariance is achieved and the finding of a between-group difference can be adequately assessed (Cheung and Rensvold, 2002). Measurement invariance relates to the psychometric properties of the measurement scales, and includes configural invariance (same number of factors and loading patterns across groups, no equality constraints); metric or weak factorial invariance (equal factor loadings); and scalar or strong invariance (equal factor loadings and intercepts). A series of measurement models were fitted to test for measurement invariance, beginning with a less constrained model, and applying constraints successively. Each progressively constrained model was nested under a less constrained model, and chi-square difference tests were used to compare the relative fit of nested models. To test for weak factorial invariance across Latino sub-groups, the chi-square from a model with all parameters allowed to be unequal across groups was compared to the chi-square from a model with only the loadings constrained to be equal across groups. To test for scalar invariance, the chi-square from the previous model was compared to the chi-square from a model with all factor loadings and intercepts constrained to equality. The Satorra-Bentler scaled chi-squared difference test was used to compare the nested models built to assess measurement invariance (Satorra and Bentler, 2001).

Following the measurement model, a structural model was constructed to test the hypothesized relationships between all constructs. Respondents' socioeconomic status, sex, age, immigrant status, marital status, language of interview, percent black non-Hispanic residents in respondent's county, and area deprivation were included as confounders. Tests for nonlinearity in the association between the three measures of ethnic density and psychological distress did not provide any evidence of nonlinear effects. All analyses were weighted to account for non-response of eligible participants and the unequal probability of being sampled, and were conducted with Mplus v.7 (Muthén and Muthén, 2012) using a modeling specification for complex sample data and a robust maximum likelihood estimator (MLR), which provided test statistics and standard errors robust to non-normality and non-independence of observations due to geographical clustering. Parameter estimates of indirect and total effects were obtained with the *model indirect* command. The total indirect effect between ethnic density and psychological distress is the sum of all indirect effects (i.e., through neighborhood cohesion and through racism and discrimination). The total effect between ethnic density and psychological distress is the sum of the direct and total indirect effects (i.e., the direct effect of ethnic density on psychological distress plus the effect of ethnic density on

psychological distress via neighborhood cohesion and racism and discrimination). Analyses examining direct and indirect effects are based on a set of assumptions, including that the specified model: (a) has no unmeasured confounders in the exposure-outcome association; (b) has no unmeasured confounders in the mediator-outcome association; (c) has no unmeasured confounders in the exposure-mediator association; and (d) has no unmeasured mediator-outcome confounders that are affected by the exposure (Cole and Hernan, 2002; VanderWeele, 2010). The multi-group SEM models examined in this study are theoretically founded and therefore include the most relevant individual- and area-level confounders available in the NLAAS, but the possibility of residual confounding remains and so findings should be interpreted with caution.

3. Results

Mexican American participants were younger and with less educational qualifications. In contrast, respondents of Cuban origin tended to be older, more likely to have been born abroad, and with higher educational qualifications.

Latino ethnic density was greater than Latin American ethnic density (ranging from 1% to 88% as compared to 0.5% to 47%, respectively). Cuban respondents lived in areas with a higher concentration of these two measures of ethnic density, although people of Mexican origin had the widest range of Latino ethnic density, from 2% up to 88%. The range of own ethnic density differed across Latino sub-groups, the highest being for Mexican Americans (up to 76%), and the lowest for Puerto Ricans (up to 24%, see Table 1).

High prevalence of experienced racism was reported by the three Latino sub-groups, with at least one experience reported throughout groups, and over three quarters reporting three or more experiences of discrimination. All Latino sub-groups reported high ratings of neighborhood cohesion across all indicators.

The full proposed model, presented in Fig. 2, fit the data well across all Latino sub-groups. Results of the multi-group analysis using the three Latino sub-groups, which assumed that the same model fit all groups equally, suggested a common configuration of the model for all Latino sub-groups across the three measures of ethnic density. Table 2 shows the results for the tests of measurement invariance. Models with progressive constraints were not found to differ in model fit compared to nested models, making Latino sub-group comparisons in the structural model possible.

3.1. Ethnic density and psychological distress

Table 3 presents the main effects of ethnic density on psychological distress across Latino sub-groups and immigrant status for the three measures of ethnic density. Results show marked differences depending on the measure of ethnic density, Latino ethnic group and generational status. For example, among Mexican American respondents, an increase in all measures of ethnic density was associated with an increase in psychological distress, but these associations were detrimental and statistically significant only for the first generation (B for a 10% increase in Mexican ethnic density: 0.780, S.E.: 0.24; B for a 10% increase in Latino ethnic density: 0.665, S.E.: 0.22; B for a 10% increase in Latin American immigrant ethnic density: 0.946, S.E.: 0.39). For Cuban Americans results showed null associations between ethnic density and psychological distress except among the second generation, whose psychological distress decreased as Latin American immigrant ethnic density increased (B for a 10% increase in Latin American immigrant ethnic density: -0.931, S.E.: 0.46).

Associations between ethnic density and psychological distress were strongest among the Puerto Rican group, for whom a 10% increase in both Latino and Latin American immigrant ethnic density was associated with a decrease in psychological distress across generational categories. These protective associations between ethnic density and psychological distress were particularly strong among mainland-born Puerto Ricans (B for a 10% increase in Latino ethnic density: −1.053, S.E.: 0.37; B for a 10% increase in Latin American immigrant ethnic density: −1.134, S.E.: 0.50; see Table 3).

3.2. Hypothesized pathways

Table 4 presents the unstandardized and standardized coefficients of the multi-group structural equation model for the three measures of ethnic density. Findings of the fully-adjusted association between ethnic density and psychological distress (shown in the first row of results), show that among Puerto Ricans, an increase in Latino and Latin American immigrant ethnic density was associated with a decrease in psychological distress (B for a 10% increase in Latino ethnic density: −0.572, S.E.: 0.19; B for a 10% increase in Latin American immigrant ethnic density: −0.710, S.E.: 0.25). In contrast, a detrimental association between all three measures of ethnic density and psychological distress was found for Mexican Americans (B for a 10% increase in Mexican ethnic density: 0.772, S.E.: 0.19; B for a 10% increase in Latino ethnic density: 0.606, S.E.: 0.16; B for a 10% increase in Latin American immigrant ethnic density: 0.639, S.E.: 0.31). Associations between ethnic density and psychological distress for Cuban Americans, although in the hypothesized protective direction, were not statistically significant (see Table 4).

Support for the two pathways varied across measures of ethnic density and Latino sub-groups, as shown in the second of third rows of results. The first hypothesized pathway, an increase in neighborhood social cohesion, was supported among Puerto Ricans when ethnic density was measured as Latino or Latin American immigrant ethnic density (B for a 10% increase in Latino ethnic density: 0.082, S.E.: 0.03; B for a 10% increase in Latin American immigrant ethnic density: 0.062, S.E.: 0.02). The second pathway, a decrease in reports of experienced racism, was supported among Mexican Americans across all three measures of ethnic density (B for a 10% increase in Mexican ethnic density: −0.216, S.E.: 0.07; B for a 10% increase in Latino ethnic density: −0.256, S.E.: 0.06; B for a 10% increase in Latin American immigrant ethnic density: −0.296, S.E.: 0.13), and among Puerto Ricans for Latino and Latin American immigrant ethnic density (B for a 10% increase in Latino ethnic density: −0.263, S.E.: 0.06; B for a 10% increase in Latin American immigrant ethnic density: −0.307, S.E.: 0.08).

The association between the two pathways and mental health are presented in the fourth and fifth rows of results. Increased reports of experienced discrimination were found to be detrimental for the psychological distress of Puerto Rican and Mexican American respondents. The associations between neighborhood cohesion and psychological distress were not statistically significant for any of the Latino ethnic groups.

Table 4 also provides estimates for the total effects of ethnic density on psychological distress, considering the influence of ethnic density on psychological distress through the hypothesized pathways. Total effects of ethnic density were most beneficial for Puerto Rican respondents, for whom both Latino and Latin American immigrant ethnic density conferred a protective effect on psychological distress (B for a 10% increase in Latino ethnic density: −0.790, S.E.: 0.14; B for a 10% increase in Latin American immigrant ethnic density: −0.968, S.E.: 0.23). In the case of the Mexican American group, results of the total effect of ethnic density

Table 1
Descriptive characteristics of the Latino sample in the NLAAS dataset.

	All Latinos ($n=1940$) %	Cubans ($n=577$) %	Puerto Ricans ($n=495$) %	Mexican Americans ($n=868$) %
Gender				
Female	47	47	51	46
Age, M(SE)	38.06 (0.46)	48.86 (0.81)	41.05 (0.79)	36.64 (0.56)
Language of interview				
English	44	23	58	43
Spanish	56	77	42	57
Immigration status				
2nd generation—Born in US	43	14	55	43
1.5 generation—Born abroad, migrated before age 13	12	16	16	11
1st generation—Born abroad, migrated after age 13	45	70	29	46
Marital status				
Married/cohabiting	67	63	55	70
Divorced/separated/widowed	13	23	20	11
Single/never married	20	14	25	19
Household income				
Bottom quintile	23	18	17	25
Second quintile	21	18	18	22
Middle quintile	22	18	17	23
Fourth quintile	19	20	24	17
Highest quintile	15	26	24	13
Educational qualifications				
11 years or less	48	30	34	53
12 years	25	25	28	24
13 to16 years	18	21	26	16
17 years or more	9	24	12	7
Employment status				
Employed	62	60	58	63
Unemployed	7	5	7	7
Not in labor force	31	35	35	30
Psychological distress, M(SE)	4.02 (0.15)	4.32 (0.24)	4.84 (0.26)	3.81 (0.18)
Area Deprivation factor score, M(SE)	0.43 (0.04)	0.59 (0.03)	−0.17 (0.04)	0.52 (0.05)
Percent black non-Hispanic, M(SE)	9.57 (0.24)	18.08 (0.17)	15.94 (0.51)	7.75 (0.28)
Own ethnic density, M(SE) [range]		23.89 (0.49)[0.1–29]	5.83 (0.22)[0–24]	31.91 (0.83)[2–88][0.43–76]
Latino ethnic density, M(SE) [range]	37.36 (0.76)[1–88]	50.49 (0.72)[4–57]	18.58 (0.59)[1–57]	39.62 (0.93)[2–88]
Latin American immigrant ethnic density, M(SE) [range]	15.54 (0.27)[0.47–47]	40.93 (0.65)[0.8–47]	9.93 (0.42)[0.5–47]	14.47 (0.31)[0.47–47]
Neighborhood cohesion (% reporting statement is somewhat true, very true)				
People can be trusted	82	88	81	82
People get along w/ each other	76	84	75	76
People help in emergency	67	76	66	67
People look out for each other	79	84	80	79
Racism (% reporting experiencing discrimination at least once a year)				
One experience	8	16	9	8
Two experiences	7	8	5	7
Three experiences or more	84	74	85	85

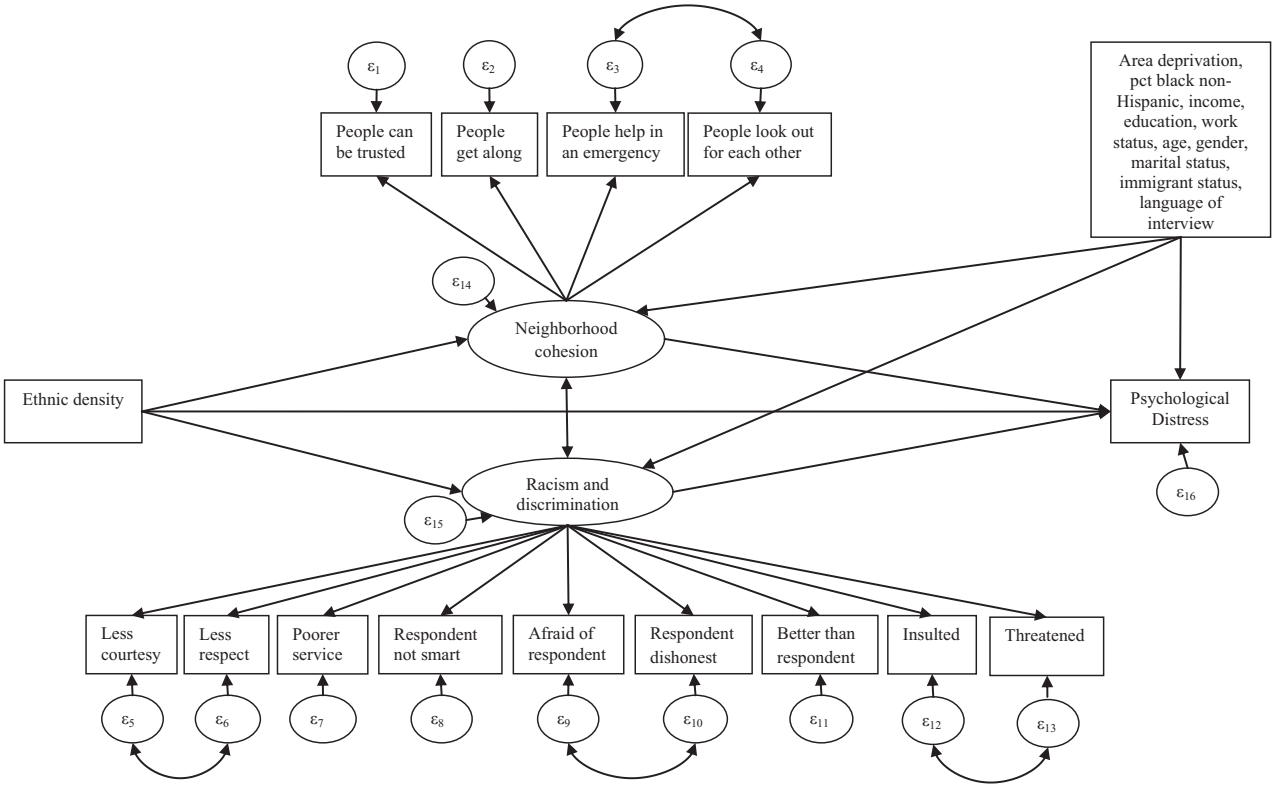
reflect the strength of the decreased racism pathway; whereas results of the main effects of all ethnic density measures were detrimentally associated with psychological distress (Table 3), when considering the reduced exposure to racism associated with an increase in ethnic density, the detrimental association between increased ethnic density and increased psychological distressed was reduced across all three measures, and only statistically significant in the models with own ethnic density (B for a 10% increase in Mexican ethnic density: 0.487, S.E.: 0.22).

4. Discussion

This study examined the association between ethnic density and psychological distress across Latino ethnic groups, immigrant status and measures of ethnic density; explored the pathways by which ethnic density is associated with psychological distress, and formally tested whether these mechanisms are the same across Latino sub-groups and measures of ethnic density. It proposed a conceptual model that hypothesized two mechanisms by which ethnic density would be associated with improved mental health: through an increase in neighborhood social cohesion, and through a reduction in the prevalence of experienced interpersonal racism.

Results of the examinations of the main effects of ethnic density on psychological distress showed clear differences in ethnic density effects across Latino sub-groups and immigration categories. Ethnic density was most beneficial for the Puerto Rican ethnic group, for whom a 10% increase in Latino and Latin American ethnic density was associated with a decrease in psychological distress. Although the three generational groups reported protective ethnic density effects, associations were stronger for mainland-born Puerto Ricans.

Among Mexican Americans, a trend for a detrimental association was found between an increase in any of the measures of



Own ethnic density model: N=1929; RMSEA =0.021; CFI =0.946; TLI =0.931.
Latino ethnic density model: N =1929; RMSEA =0.021; CFI =0.947; TLI =0.933.
Latin American immigrant ethnic density model: N=1929; RMSEA =0.020; CFI =0.949; TLI =0.935.

Fig. 2. Structural Equation Model examining ethnic density effects on psychological distress.

Table 2
Model comparison and summary of test of parameter invariance across Latino sub-groups for different measures of ethnic density.

	Chi^2(df)[a]	Satorra–Bentler Scaled Chi^2(df) Δ	p Δ	RMSEA	CFI	TLI
Own ethnic density						
Model 1. Measurement non-invariance	478.278(246)			0.028	0.964	0.954
Model 2. Weak invariance (factor loadings invariant)	525.463(268)	23.42(22)	0.3783	0.026	0.965	0.959
Model 3. Strong invariance (factor loadings and intercepts invariant)	559.735(290)	29.03(22)	0.1440	0.026	0.963	0.959
Latino ethnic density						
Model 1. Measurement non-invariance	461.819(246)			0.026	0.967	0.958
Model 2. Weak invariance (factor loadings invariant)	508.938(268)	23.47(22)	0.3756	0.025	0.968	0.962
Model 3. Strong invariance (factor loadings and intercepts invariant)	543.175(290)	29.01(22)	0.1445	0.025	0.966	0.963
Latin American immigrant ethnic density						
Model 1. Measurement non-invariance	477.488(246)			0.028	0.963	0.953
Model 2. Weak invariance (factor loadings invariant)	524.511(268)	23.42(22)	0.3783	0.026	0.964	0.958
Model 3. Strong invariance (factor loadings and intercepts invariant)	558.791(290)	29.02(22)	0.1442	0.026	0.962	0.959

[a] Includes scaling correction factor for MLR.

ethnic density and a worsening in psychological distress. These associations were driven by the first generation, for whom increased ethnic density was statistically significantly associated with increased psychological distress; for the 1.5 and second generations, the associations between ethnic density and psychological distress were not statistically significant. No associations between ethnic density and psychological distress were found for Cuban Americans.

The second part of the analyses provided support for both hypothesized mechanisms, although differences also emerged across Latino sub-groups. For example, the neighborhood cohesion mechanism was only supported among the Puerto Rican sub-group (but not for own ethnic density), and the decreased racism mechanism was found to be statistically significant among Puerto Ricans and Mexican Americans, and not supported by Cuban Americans. Although some differences were found between measures of ethnic density among the Mexican American sub-group, for the most part results were fairly similar across ethnic density measures.

The first conclusion from this study is therefore that, although the *measurement* of the conceptual model is similar across Latino sub-groups, there are some interesting *structural* differences. US Latinos are a large heterogeneous group differing not only in the timing and reason for migration, but also in terms of their current rights and freedom of movement to and from the US. For example, as US citizens, Puerto Ricans experience the fewest legal barriers to migration among the Latino sub-groups examined in this study. However, despite being US citizens, the first Puerto Rican migrants

Table 3
Main effects of ethnic density on psychological distress, by Latino sub-group, generational status and measure of ethnic density (10% increase).

	Own ethnic density Coeff (S.E.)	**Latino ethnic density** Coeff (S.E.)	**Latin American immigrant ethnic density** Coeff (S.E.)
Cuban Americans (*n*=575)	−0.391 (0.34)	−0.227 (0.30)	−0.222 (0.29)
US born (*n*=76)	−0.865 (0.49)	−0.787 (0.44)	−0.931 (0.46)*
1.5 gen (*n*=100)	−0.253 (0.97)	0.038 (0.50)	0.441 (0.40)
1st gen (*n*=399)	−0.296 (0.24)	0.118 (0.33)	−0.112 (0.24)
Puerto Ricans (*n*=491)	−0.063 (0.73)	−0.800 (0.14)***	−0.999 (0.24)***
US born (*n*=277)	−0.976 (1.06)	−1.053 (0.37)***	−1.134 (0.50)*
1.5 gen (*n*=85)	−1.213 (1.12)	−0.821 (0.40)*	−0.806 (0.41)*
1st gen (*n*=129)	1.574 (0.97)	−0.342 (0.44)	−0.979 (0.37)**
Mexican Americans (*n*=863)	0.430 (0.23)	0.244 (0.18)	0.246 (0.28)
US born (*n*=380)	0.302 (0.31)	0.059 (0.22)	−0.004 (0.36)
1.5 gen (*n*=96)	−0.207 (0.58)	−0.242 (0.55)	0.071 (1.16)
1st gen (*n*=387)	0.780 (0.24)***	0.665 (0.22)***	0.946 (0.39)*

Unstandardized coefficients presented.
Models adjust for age, sex, neighborhood level deprivation, percent Black non-Hispanic in county, household income, education, work status, marital status, language of interview and generational status (in pooled analyses only).

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 4
Unstandardized and standardized path coefficient estimates by measure of ethnic density (10% increase).

Parameter estimate	**Own ethnic density**			**Latino ethnic density**			**Latin American immigrant ethnic density**		
	Unstandard. (SE)	Standardized (SE)	*P*	Unstandard. (SE)	Standardized (SE)	*P*	Unstandard. (SE)	Standardized (SE)	*P*
Ethnic density → Psychological distress									
Cuban	−0.562 (0.46)	−0.126 (0.11)	0.223	−0.067 (0.29)	−0.022 (0.10)	0.820	−0.397 (0.36)	−0.115 (0.11)	0.274
Puerto Rican	0.133 (0.57)	0.014 (0.06)	0.817	−0.572 (0.19)	−0.176 (0.07)	0.002	−0.710 (0.25)	−0.164 (0.07)	0.005
Mexican American	0.772 (0.19)	0.428 (0.15)	<0.001	0.606 (0.16)	0.376 (0.139)	<0.001	0.639 (0.31)	0.134 (0.07)	0.039
Ethnic density → N'hood cohesion									
Cuban	0.047 (0.07)	0.077 (0.11)	0.476	0.145 (0.09)	0.343 (0.24)	0.100	0.080 (0.07)	0.169 (0.16)	0.251
Puerto Rican	−0.076 (0.10)	−0.055 (0.07)	0.440	0.082 (0.03)	0.170 (0.06)	0.003	0.062 (0.02)	0.098 (0.05)	0.012
Mexican American	−0.025 (0.03)	−0.084 (0.12)	0.466	−0.001 (0.03)	−0.006 (0.12)	0.961	−0.040 (0.06)	−0.050 (0.08)	0.508
Ethnic density → Racism									
Cuban	0.103 (0.24)	0.145 (0.33)	0.672	−0.144 (0.18)	−0.298 (0.38)	0.422	0.086 (0.17)	0.156 (0.30)	0.610
Puerto Rican	−0.161 (0.22)	−0.069 (0.09)	0.460	−0.263 (0.06)	−0.320 (0.09)	<0.001	−0.307 (0.08)	−0.284 (0.10)	<0.001
Mexican American	−0.216 (0.07)	−0.439 (0.17)	0.003	−0.256 (0.06)	−0.583 (0.18)	<0.001	−0.296 (0.13)	−0.228 (0.10)	0.027
N'hood cohesion → Psychological distress									
Cuban	0.451 (0.63)	0.062 (0.089)	0.477	0.434 (0.60)	0.060 (0.08)	0.468	0.454 (0.63)	0.063 (0.09)	0.471
Puerto Rican	0.148 (0.58)	0.022 (0.09)	0.799	0.193 (0.57)	0.029 (0.08)	0.736	0.147 (0.57)	0.022 (0.08)	0.797
Mexican American	−0.685 (0.42)	−0.113 (0.07)	0.102	−0.682 (0.41)	−0.113 (0.07)	0.099	−0.698 (0.41)	−0.115 (0.06)	0.089
Racism → Psychological distress									
Cuban	1.669 (0.98)	0.266 (0.17)	0.089	1.715 (1.02)	0.272 (0.17)	0.092	1.681 (1.00)	0.269 (0.17)	0.094
Puerto Rican	1.002 (0.39)	0.251 (0.10)	0.010	0.887 (0.41)	0.224 (0.10)	0.031	0.870 (0.40)	0.219 (0.10)	0.031
Mexican American	1.401 (0.30)	0.381 (0.07)	<0.001	1.378 (0.30)	0.375 (0.07)	<0.001	1.319 (0.29)	0.359 (0.07)	<0.001
Total effects									
Cuban	−0.369 (0.34)	−0.083 (0.08)	0.278	−0.251 (0.32)	−0.082 (0.11)	0.426	−0.215 (0.30)	−0.062 (0.09)	0.466
Puerto Rican	−0.039 (0.71)	−0.004 (0.08)	0.956	−0.790 (0.14)	−0.243 (0.06)	<0.001	−0.968 (0.23)	−0.225 (0.08)	<0.001
Mexican American	0.487 (0.22)	0.270 (0.14)	0.027	0.254 (0.18)	0.158 (0.12)	0.160	0.276 (0.28)	0.058 (0.06)	0.324
Total indirect effects									
Cuban	0.193 (0.42)	0.043 (0.10)	0.646	−0.185 (0.35)	−0.060 (0.12)	0.603	0.181 (0.30)	0.053 (0.09)	0.547
Puerto Rican	−0.173 (0.22)	−0.019 (0.02)	0.424	−0.218 (0.11)	−0.067 (0.04)	0.056	−0.258 (0.14)	−0.060 (0.04)	0.063
Mexican American	−0.285 (0.12)	−0.158 (0.08)	0.018	−0.351 (0.10)	−0.218 (0.08)	0.001	−0.363 (0.18)	−0.076 (0.04)	0.048

arrived into the US stigmatized by the public perception that they migrated because of massive unemployment on the Island and the desire to be supported by welfare (Maldonado, 1976), which might have led to Puerto Ricans experiencing more discrimination and stereotyping than other Latino sub-ethnic groups (Alegría et al., 2006), and suffering from increased racialization and stigmatization as compared to migrants from other Central and Latin American countries. These experiences have transpired into their health profile; Puerto Ricans have the worst health status (Vega and Amaro, 1994) and exhibit higher rates of many psychological disorders than other Latino ethnic groups (Alegría et al., 2006). Given this disadvantaged context and racialized profile, Puerto Ricans benefit the most from the buffering properties of the ethnic density effect, which can be observed in these results, as they are the only group to report a protective ethnic density effect, and to provide support for both mechanisms.

Mexican migrants have the greatest barriers to enter the US (Massey, 1993), and therefore the fewest rights. Given the importance of immigrant enclaves for newly arrived migrants, it would be expected that immigrant ethnic density would be particularly

relevant for the first generation Mexican American population, but this was not found to be the case. It is not clear why ethnic density effects on psychological distress were not found for the Mexican American ethnic group. Studies that have provided support for ethnic density effects among Mexican American populations have been conducted in specific US regions with a long-standing history of Mexican migrants (Eschbach et al., 2004; Franzini and Spears, 2003; Inagami et al., 2006; Ostir et al., 2003; Patel et al., 2003). The NLAAS is a nationally representative dataset, and it is possible that the processes operating at regional levels are not captured by the sampling of the NLAAS. Nonetheless, strong associations were reported between increased ethnic density and decreased exposure to racism among Mexican Americans.

Although Cuban migration to the US has mainly occurred in four waves with differing reasons for migration and socioeconomic resources, the attitude of the US government towards Cuban migrants has allowed them to enter as political exiles rather than economic immigrants, offering them privileges that other Latino migrants do not enjoy. The Cuban group has been successful in integrating their new migrants into the U.S with a politically and socially well-developed enclave (Perez et al., 2008), and in contrast to the situation experienced by the Puerto Rican group, may require the least buffering benefits from ethnic density.

Ethnic density has been hypothesized to impact on health through several pathways, and this study was only able to examine two of them. Stronger support was found for the reduced experiences of racism pathway, and based on other examinations of the association between exposure to racism and ethnic density (Bécares et al., 2012a, 2009; Das-Munshi et al., 2010; Stafford et al., 2010), it is plausible that a reduction in the exposure to racism, and a buffering of the detrimental association between racism and health, is the most important pathway by which ethnic density protects the health of some ethnic minorities. These findings show that the presence of ethnic density effects through one mechanism does not necessarily entail the occurrence of another mechanism, nor it means, as described above, that ethnic density acts out in a similar way across ethnic minority groups. Cross-national comparisons of ethnic density effects have demonstrated the role of context in the development of ethnic density effects (Bécares et al., 2012a), and given the diversity between Latinos in the US across (and within) groups in terms of different countries of origin, differing reasons for migration, and differing cultural, economic and demographic profiles, it's not unexpected that ethnic density performs differently across populations, both in terms of mechanisms and health outcomes.

Limitations of this study should be acknowledged. First, because of the cross-sectional design of the NLAAS, direction of causality and issues of selection and endogeneity could not be assessed. Second, the level of ethnic density available for this study was the county. US counties vary in size, ranging from 140 to over nine million residents. The large geographical characteristics of counties render them a difficult geographical level to use in neighborhood effects research, since they might be less effective than lower geographical levels in capturing the lived experience of an area. The only study that to date has examined Latino ethnic density at two different levels of geography reported protective effects for years of life lost because of heart disease at census tract, but not at county level (Franzini and Spears, 2003), providing some support for the need to measure ethnic density at smaller areas. Despite their large size, associations between ethnic density at the county level and psychological distress, neighborhood cohesion, and exposure to racism were detected. A related limitation in terms of geographical characteristics is the lack of consideration given to the broader context where the analyzed counties are nested into. Immigration and settlement patterns of Latin American immigrants and subsequent generations differ greatly depending on the country of origin and state of destination, and so it is likely that the dynamics of a county with high ethnic density vary depending on whether said county is in a state with a longstanding history of in-migration and a high percentage of Latino residents, as compared to a state composed mostly of white residents with limited previous history of accommodating new migrants. The examination of how the broader context moderates ethnic density effects is beyond the scope of this study, but future research on ethnic density should consider how dynamics at the smaller geographical levels depend on wider geographical scales including state, region, and country.

Fourth, although analyses looking at the main effect between ethnic density and psychological distress were stratified based on immigrant status, the small sample sizes existent when breaking down Latino sub-groups into immigrant status did not allow for an examination of the hypothesized mechanisms across immigrant groups. This is an important caveat given the documented differences in main effects of ethnic density on health across immigrant categories.

And finally, this study examined two pathways by which ethnic density might lead to improved health outcomes. Other pathways have been proposed, including increased political involvement (Bécares et al., 2009; Stafford et al., 2010) and reduced social status stigma (Pickett and Wilkinson, 2008). Incorporating a more comprehensive study of all possible pathways would undoubtedly lead to a greater understanding of the ethnic density effect.

Despite its limitations, this study is the first to examine ethnic density effects on mental health by Latino sub-groups and immigrant status, and simultaneously examine several mechanisms behind the ethnic density effect, across Latino sub-groups and measures of ethnic density. Findings show that although the conceptualization of ethnic density effects is the same across Latino ethnic groups, the structure of ethnic density and its mechanisms is dependent on the current and historical context of the specific sub-groups, including reasons for migration, rights upon arrival, and subsequent racialization into the US society.

Acknowledgments

The author was supported by a UK Economic and Social Research Council (ESRC) Grant (ES/K001582/1), a Hallsworth Research Fellowship, and an 'Investing in Success' grant from the University of Manchester. She would like to thank Tarani Chandola for feedback on an earlier version of this manuscript, and Mai Stafford for support and feedback in the early stages of this work. No conflict of interest is reported. This study was possible by funding to NLAAS II: Unraveling Differences for Clinical Services is funded by the National Institute of Mental Health: U01 MH-062209, U01 MH-062207 and additional support from the OBSSR and SAMHSA.

References

Alba, R., Nee, V., 1997. Rethinking assimilation theory for a new era of immigration. Int. Migr. Rev. 31, 826–874.

Alegría, M., Canino, G., Stinson, F., Grant, B., 2006. Nativity and DSM-IV psychiatric disorders among Puerto Ricans, Cuban Americans and non-Latino Whites in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. J. Clin. Psychiatry 67, 56.

Alegria, M., Mulvaney-Day, N., Torres, M., Polo, A., Cao, Z., Canino, G., 2007. Prevalence of psychiatric disorders across Latino subgroups in the United States. Am. J. Public Health 97, 68–75.

Alegria, M., Takeuchi, D., Canino, G., Duan, N., Shrout, P., Meng, X., Vega, W., Zane, N., Vila, D., Woo, M., Vera, M., Guarnaccia, P., Aguilar-Gaxiola, S., Sue, S., Escobar, J., Lin, K., Gong, F., 2004. Considering context, place and culture: the national Latino and Asian American study. Int. J. Methods Psychiatr. Res. 13, 208–220.

Bankston, C., Zhou, M., 2002. Social capital as a process: the meanings and problems of a theoretical metaphor. Sociol. Inq. 3, 285–317.

Bécares, L., 2009. The Ethnic Density Effect on the Health of Ethnic Minority People in the United Kingdom: A Study of Hypothesised Pathways, Epidemiology and Public Health. University College London, London.
Bécares, L., Nazroo, J., Jackson, J., Heuvelman, H., 2012a. Ethnic density effects among Caribbean people in the US and England: a cross-national comparison. Soc. Sci. Med. 75, 2107–2115.
Bécares, L., Nazroo, J., Stafford, M., 2009. The buffering effects of ethnic density on experienced racism and health. Health Place 15, 670–678.
Bécares, L., Shaw, R., Nazroo, J., Stafford, M., Atkin, K., Albor, C., Kiernan, K., Wilkinson, R., Pickett, K., 2012b. Ethnic density effects on physical morbidity, mortality and health behaviors: a systematic review of the literature. Am. J. Public Health 102, e33–e66.
Bécares, L., Stafford, M., Laurence, J., Nazroo, J., 2011. Composition, concentration, and deprivation. exploring their association with social cohesion among different ethnic groups in the UK. Urban Stud. 48, 2771–2787.
Berkman, L., Kawachi, I., 2000. Social cohesion, social capital, and health. In: Berkman, L., Kawachi, I. (Eds.), Social Epidemiology. Oxford University Press, New York, pp. 174–190.
Bhugra, D., Becker, M., 2005. Migration, cultural bereavement and cultural identity. World Psychiatry 4, 18–24.
Browne, M., Cudeck, R., 1993. Alternative ways of assessing model fit. In: Bollen, K., Long, J. (Eds.), Testing Structural Equation Models. Sage, Beverly Hills, CA, pp. 136–162.
Cagney, K., Browning, C., Wallace, D., 2007. The Latino paradox in neighborhood context: the case of asthma and other respiratory conditions. Am. J. Public Health 97, 919–925.
Cole, S., Hernan, M., 2002. Fallibility in estimating direct effects. Int. J. Epidemiol. 31, 163–165.
Cheung, G., Rensvold, R., 2002. Evaluating goodness-of-fit indexes for testing measurement invariance. Struct. Equ. Model. 9, 233–255.
Chiswick, B., Miller, P., 2005. Do enclaves matter in immigrant adjustment? City Commun. 4, 5–35.
Daley, P., 1998. Black Africans in Great Britain: spatial concentration and segregation. Urban Stud. 35, 1703–1724.
Das-Munshi, J., Bécares, L., Stansfeld, S., Prince, M., 2010. Understanding the ethnic density effect on mental health: Multi-level investigation of survey data from England. Br. Med. J. 341, c5367.
Ennis, S., Rios-Vargas, M., Albert, N., 2011. The Hispanic Population: 2010, 2010 Census Briefs. United Census Bureau.
Eschbach, K., Ostir, G., Patel, K., Markides, K., Goodwin, J., 2004. Neighborhood context and mortality among older Mexican Americans: is there a barrio advantage? Am. J.f Public Health 94, 1807–1812.
Fone, D., Dunstan, F., Lloyd, K., Williams, G., Watkins, J., Palmer, S., 2007. Does social cohesion modify the association between area income deprivation and mental health? A multilevel analysis. Int. J. Epidemiol. 36, 338–345.
Franzini, L., Spears, W., 2003. Contributions of social context to inequalities in years of life lost to heart disease in Texas, USA. Soc. Sci. Med. 57, 1847–1861.
Hagenaars, A., de Vos, K., Zaidi, M., 1994. Poverty Statistics in the Late 1980s: Research Based on Micro-data. Office for Official Publications of the European Communities, Luxembourg.
Halpern, D., Nazroo, J., 2000. The ethnic density effect: results from a national community survey of England and Wales. Int. J. Soc. Psychiatry 46, 34–46.
Harris, R., Tobias, M., Jeffreys, M., Waldegrave, K., Karlsen, S., Nazroo, J., 2006. Effects of self-reported racial discrimination and deprivation on Maori health and inequalities in New Zealand: cross-sectional study. Lancet 367, 2005–2009.
Heeringa, S., Wagner, J., Torres, M., Duan, N., Adams, T., Berglund, P., 2004. Sample designs and sampling methods for the Collaborative Psychiatric Epidemiology Studies (CPES). Int. J. Methods Psychiatr. Res. 13, 221–240.
Hu, L., Bentler, P., 1995. Evaluating model fit. In: Hoyle, H. (Ed.), Structural Equation Modeling. Concepts, Issues, and Applications. Sage, London, pp. 76–99.
Inagami, S., Borrell, L., Wong, M., Fang, J., Shapiro, M., Asch, S., 2006. Residential segregation and Latino, black and white mortality in New York City. J. Urban Health 83, 406–420.
Karlsen, S., Nazroo, J., 2002. Relation between racial discrimination, social class, and health among ethnic minority groups. Am. J. Public Health 92, 624–631.
Kessler, R., Andrews, G., Colpe, L., Hiripi, E., Mroczek, D., Normand, S., Walters, E., Zaslavsky, A., 2002. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. Psychol. Med. 32, 959–976.
Krieger, N., Sidney, S., 1996. Racial discrimination and blood pressure: the CARDIA study of young black and white adults. Am. J. Public Health 86, 1370–1378.
Lee, M., 2009. Neighborhood residential segregation and mental health: a multilevel analysis on Hispanic Americans in Chicago. Soc. Sci. Med. 68, 1975–1984.
Maldonado, D., 1976. The Emigration Dialectic: Puerto Rico and the USA. International Publishers, New York, NY.
Mason, S., Kaufman, J., Daniels, J., Emch, M., Hogan, V., Savitz, D., 2011. Neighborhood ethnic density and preterm birth across seven ethnic groups in New York City. Health Place 17, 280–288.
Massey, D., 1993. Latinos, poverty, and the underclass: a new agenda for research. Hisp. J. Behav. Sci. 15, 449–475.
Muthén, L., Muthén, B., 2012. Mplus User's Guide. Seventh Edition, Los Angeles, CA.
Ostir, G., Eschbach, K., Markides, K., Goodwin, J., 2003. Neighbourhood composition and depressive symptoms among older Mexican Americans. J. Epidemiol. Commun. Health 57, 987–992.
Osypuk, L., Bates, L., Acevedo-Garcia, D., 2010. Another Mexican birthweight paradox? The role of residential enclaves and neighborhood poverty in the birthweight of Mexican-origin infants. Soc. Sci. Med. 70, 550–560.
Paradies, Y., 2006. A systematic review of empirical research on self-reported racism and health. Int. J. Epidemiol. 35, 888–901.
Patel, K., Eschbach, K., Rudkin, L., Peek, M., Markides, K., 2003. Neighborhood context and self-rated health in older Mexican Americans. Ann. Epidemiol. 13, 620–628.
Perez, D., Fortuna, L., Alegria, M., 2008. Prevalence and correlates of everyday discrimination among U.S. Latinos. J. Commun. Psychol. 36, 421–433.
Pickett, K., Pearl, M., 2001. Multilevel analyses of neighbourhood socioeconomic context and health outcomes: a critical review. J. Epidemiol. Commun. Health, 55.
Pickett, K., Wilkinson, R., 2008. People like us: ethnic group density effects on health. Ethn. Health, 13.
Portes, A., Rumbaut, R., 2000. Not everyone is chosen: segmented assimilation and its determinants. Working Paper Series. Princeton University, The Center for Migration and Development.
Portes, A., Truelove, C., 1987. Making sense of diversity: recent research on Hispanic minorities in the United States. Ann. Rev. Sociol. 13, 359–385.
Portes, A., Zhou, M., 1993. The new second generation: segmented assimilation and its variants. Ann. Acad. Polit. Soc. Sci., 74–96.
Riva, M., Gauvin, L., Barnett, T., 2007. Toward the next generation of research into small area effects on health: a syntnesis of multilevel investigations published since July 1998. J. Epidemiol. Commun. Health 61, 853–861.
Satorra, A., Bentler, P., 2001. A scaled difference chi-square test statistic for moment structure analysis. Psychometrika 66, 507–514.
Shaw, R., Atkin, K., Bécares, L., Albor, C., Stafford, M., Kiernan, K., Nazroo, J., Wilkinson, R., Pickett, K., 2012. Impact of ethnic density on adult mental disorders: narrative review. Br. J. Psychiatry 201, 11–19.
Smaje, C., 1995. Ethnic residential concentration and health: evidence for a positive effect? Policy Polit. 23, 251–269.
Stafford, M., Bartley, M., Sacker, A., Marmot, M., 2003. Measuring the social environment: social cohesion and material deprivation in English and Scottish neighbourhoods. Environ. Plan. A 35, 1459–1475.
Stafford, M., Bécares, L., Nazroo, J., 2010. Racial discrimination and health: exploring the possible protective effects of ethnic density. In: Stillwell, J. (Ed.), Understanding Population Trends and Processes. Springer, Dordrecht, The Netherlands.
VanderWeele, T.J., 2010. Bias formulas for sensitivity analysis for direct and indirect effects. Epidemiology 21, 540–551.
Vega, W., Amaro, H., 1994. Latino outlook: good health, uncertain prognosis. Annu. Rev. Public Health 15, 39–67.
Vega, W., Kolody, B., Valle, R., Weir, J., 1991. Social networks, social support, and their relationship to depression among immigrant Mexican women. Hum. Organ. 50, 54–62.
Viruell-Fuentes, E., Miranda, P., Abdulrahim, S., 2012. More than culture: structural racism, intersectionality theory, and immigrant health. Soc. Sci. Med. 75, 2099–2106.
Williams, D., Collins, C., 2001. Racial residential segregation: a fundamental cause of racial disparities in health. Public Health Rep. 116, 404–416.
Williams, D., Yu, Y., Jackson, J., Anderson, N., 1997. Racial differences in physical and mental health: socioeconomic status, stress, and discrimination. J. Health Psychol. 2, 335–351.
Zsembik, B., Fennell, D., 2005. Ethnic variation in health and the determinants of health among Latinos. Soc. Sci. Med. 61, 53–63.